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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/045,118	03/20/1998	KOUSUKE SUZUKI	980268	9451
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23850 7590 07/02/2002

ARMSTRONG, WESTERMAN & HATTORI, LLP
1725 K STREET, NW.
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

BEREZNY, NEAL

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 07/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/045,118

Applicant(s)

SUZUKI ET AL.

Examiner

Neal Berezny

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29,31,33-35,37-39,41 and 42 is/are pending in the application.
- 4a) Of the above claim(s) 1-27 and 42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28,29,31,33-35,37-39 and 41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 1998 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 15 April 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 15 April 2002 and 14 February 2001 and 0 is: a) ☐ approved b) ☒ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
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DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 4/15/02, paper 23, 2/14/01, paper 20, and 6/7/00, paper 11 have been disapproved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 4/15/02, 2/14/01, and 6/7/00 have been disapproved because they introduce new matter into the drawings. 37 CFR 1.121(a)(6) states that no amendment may introduce new matter into the disclosure of an application. The original disclosure does not support the showing of the following;

A. Fig. 3 and 4, the change from N_2O to H_2O is not completely supported by the original specification, since the original specifications, p.15, discusses the use of N_2O as a source gas, it is conceivable that the figures were intending to also show residual source gases.

B. Fig.3-13, contain new matter because the terms Q and Pm are removed, as well as one of the vertical axis, and the vertical axis is now defined that as the "partial pressure of released species in Torr". Applicant asserts that these terms are well understood in the art and "the specifications clearly states that the vertical axis represents the partial pressure of the released species in terms of Torr." Examiner requests that applicant specifically cite where in the original specifications such a statement is made. Further, examiner requests that applicant provide references or

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evidence to show that the terms Q and Pm are notoriously well known in the art and need not be described in the specifications. Further, applicant's highlighting of the "relevant" sections of the plots fails to have support in the original specifications nor does it necessarily clarify the uncertainties in the drawings.

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the principle of the present invention, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Figs. 3-14 are replete with errors, contradictions, and vague, indefinite, and incomplete information. As an example, but by no means a complete list, the following are provided:

A. The terms Q and Pm have not been defined or described in either the drawing or the specifications.

B. Figs. 3 and 4 refer to different features that are inconsistent with the original specification. See p.15, ln.24-29, where reference is made to 200⁰C and H₂O, which is not found in the drawings.

C. Many of the plot lines are not labeled, and those that are labeled, it is not clear which lines that cross and overlap, are continuations of the labeled lines and which are not.

Correction is required.

Specification

3. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125(a) because the numerous changes required by applicant leads to extensive work on the part of the office and could lead to errors in the printing of the patent.
4. A substitute specification filed under 37 CFR 1.125(a) must only contain subject matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

Response to Amendment

5. The amendment filed 4/15/02 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

A. P.16, ln.4-5, the ratio of N₂O to H₂O was changed to the ratio of N₂O to SiH₄. Applicant asserts that no new matter was introduced because SiH₄ was cited as a source gas. Examiner does not construe this as sufficient support because such support for a correction is required to be void of any ambiguity. It is possible that other

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source gases could have been intended, and/or that since H₂O in the oxide is germane to applicant's invention, that perhaps applicant's ratio was concerned with the H₂O in the source gas.

B. P. 15, ln. 27, plasma power of 200C was changed to 200 W. Applicant citing in the specifications to support the change depends on identifying a phrase with the same expression as the amendment. Examiner does not construe this as sufficient support because such support for a correction is required to be void of any ambiguity. Since both the amendment paragraph and the citing used for support both heating and temperatures, the error could be in the word "of", with the correct word being "at", indicating the process was at conventional power and at 200⁰C. Further, applicant's new matter statement needs to find support in the **original** specifications and not the **present** specifications. See p.7, ln.14 &16, of the response.

C. P.16, ln.15, H₂ was changed to H₂O. Applicant merely asserts that this correction is obvious from the specifications, but fails to cite any support. Applicant's statements are conclusory and not persuasive in the absence of supporting rationale. Further, H₂ gas in oxides is a major concern in the art and the rest of the sentence refers to Si-H bonds in the oxide.

D. P.17, ln.15, Fig.10 has been changed to Fig.8, and applicant provides no support from the original specifications. In the previous amendment the change was from Fig.10 to Fig.9 and now Fig.8.

E. P.27, ln.15, and p.20, ln.12, were amended from 50kW to 50W. Applicant's citing refers to the "possibility" of setting the high-frequency power to less

than 100 W. Examiner does not construe this as sufficient support because such support for a correction is required to be void of any ambiguity. The citing was before the amended text and referred to a generalized discussion, whereas the amended text describe specific embodiments, and the alleged error occurs in two locations. It is not clear which one was in error.

F. Replacement paragraph beginning at p.16, ln.27, applicant changed Fig.3 to Fig.4 in amendment D, dated 3/1/01, paper #19, which lacks support in the specifications. Applicant is required to both identify support and make a statement that no new matter had been entered.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 28, 29, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in combination with Toyotaka (JP 07135208 A) and Oda (JP 6-204420 A). AAPA forms a semiconductor device with a substrate, fig.1c, el.1, gate electrode, el.3a, diffusion region, el.1A and 1B, sidewall insulator, fig.1d, el.3a and 3b, self-aligned contact hole, fig.1h, el.1c and 1d, first

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insulator, fig.2, el.6, second insulator, el.4, interlayer insulator, fig.1f, el.5, and contact hole in interlayer insulator and through first and second insulators, fig.1g, el.5a and 5b. A conductive pattern is necessarily formed in the contact hole to make contact to the devices so that they can be used in an electronic circuit. AAPA does not teach the reduced water content in the first oxide. Toyotaka teaches forming an insulating film with removed H₂O. It would be obvious to one skilled in the art to combine the teachings of Toyotaka with AAPA and remove water from the gate oxide region to reduce the level of interfacial states and increase the device's resistance to the hot electron effect. Further, Oda teaches the well-known art of forming silicide contacts in both the source/drain regions and on the gate electrode. It would be obvious to make silicide contacts to the source and drain since that would reduce the contact resistance of the device and improve performance, as taught by Oda, see bottom of translated abstract.

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Toyotaka and Oda as applied to claims 28, 29, and 33 above, and further in view of Lage et al. (5,485,420). The combinations of AAPA, Toyotaka and Oda appear not to specifically show the formation of the interconnect structure that electrically connects to the latched gates. Lage teaches forming self-aligned contacts consisting of a conductor pattern, fig.9, el.62, contacting a diffusion region, el.81, and a gate electrode, el.79, such that the conductor extends along a surface of the spacer, el.52. It would be obvious to one of ordinary skill in the art to build the circuits of the AAPA, Toyotaka and

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Oda combination to have latched gates by forming the interconnect structure of Lage in order to reduce the number of process steps by connecting the gate with the source or drain and also contacting the source, drain, and gate in a single layer/step, thereby building a well known and useful circuit type to be used in larger circuits.

9. Claims 34, 37, 38, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, in combination with Wolf, Vol.2, p.194-198 and Oda (JP 6-204420 A). AAPA forms a semiconductor device with a substrate, fig.1c, el.1, gate electrode, el.3a, diffusion region, el.1A and 1B, sidewall insulator, fig.1d, el.3a and 3b, self-aligned contact hole, fig.1h, el.1c and 1d, first insulator, fig.2, el.6, second insulator, el.4, interlayer insulator, fig.1f, el.5, and contact hole in interlayer insulator and through first and second insulators, fig.1g, el.5a and 5b. A conductive pattern is necessarily formed in the contact hole to make contact to the devices so that they can be used in an electronic circuit. AAPA does not teach the use of B and/or P to act as a gettering agent in order to reduced water content in the first oxide. Wolf, p.196, teaches forming an insulating film with B and P at 3-5 wt% each, in order to act as a gettering agent to remove contaminants, such as H₂O, from sensitive areas. It would be obvious to one skilled in the art to combine the teachings of Wolf with AAPA and use B and P as gettering agents to remove water from the gate oxide region to reduce the level of interfacial states and increase the device's resistance to the hot electron effect. Further, Oda teaches the well known art of forming silicide contacts in both the source/drain regions and on the gate electrode. It would be obvious to make silicide contacts on the

source and drain regions since that would reduce the contact resistance of the device and improve performance, as taught by Oda, see bottom of translated abstract.

10. Claims 35 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Wolf, and Oda as applied to claims 34, 37, 38, and 41 above, and further in view of Lage et al. (5,485,420). The combinations of AAPA, Wolf, and Oda appear not to specifically show the formation of the interconnect structure that electrically connects to the latched gates. Lage teaches forming self-aligned contacts consisting of a conductor pattern, fig.9, el.62, contacting a diffusion region, el.81, and a gate electrode, el.79, such that the conductor extends along a surface of the spacer, el.52. It would be obvious to one of ordinary skill in the art to build the circuits of the AAPA, Wolf, and Oda combination to have latched gates by forming the interconnect structure of Lage in order to reduce the number of process steps by connecting the gate with the source or drain and also contacting the source, drain, and gate in a single layer/step, thereby building a well known and useful circuit type to be used in larger circuits.

Response to Arguments

11. Applicant's arguments filed 4/15/02 have been fully considered but they are not persuasive. The drawings, summary, and entire specifications are objected to. All pending claims under consideration stand rejected under 35 USC 103.

12. The specifications are replete with errors that require objections and 112 rejections, but correcting such errors inevitably constitute new matter, due to the nature of the errors, thus requiring additional amendments, that still appear not to overcome the new matter issues and overly complicate the prosecution history requiring a substitute specification, which still would not solve the error/new matter issues. It appears that a Continuation-In-Part may be the best means of overcoming these objections and rejections.

13. Applicant's arguments regarding new matter issues are not convincing because they present arguments that assert that these changes "could" be supported by the original specifications. Applicant has the burden to demonstrate that no other reasonable interpretation of the specifications exist, and therefore the amendment does not, nor could not, change the scope of the original specifications. Support in the original specifications, is not seen by examiner.

14. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a

reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

15. In response to applicant's argument that the alleged absence of motivation to combine on the grounds that applicant has identified a specific problem allegedly not taught in the prior art of record, is incorrect because the cited textbook by Wolf, clearly teaches the broader problem and solution of reducing H₂O in all oxides in order to reduce OH charge traps. Applicant's assertion of an allegedly unique discovery is not of OH charge traps induced by H₂O contamination, but of a specific situation in which H₂O contamination induces OH charge traps. The fact that applicant has recognized another specific advantage which would flow naturally from following the broader, more general suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, Wolf provides the motivation to combine the teachings by pointing out on p.195, table 4.4, property 5 and 18, that a good oxide should not absorb or permeate moisture, in order to reduce charge trap densities, and reduce outgassing. Both Toyotaka and Wolf teach that these qualities of an oxide are desirable and such oxides should be used for general applications. One of ordinary skill in the art would find it obvious to use quality oxides in general, and would therefore use such an oxide for the first oxide. The fact that applicant had discovered a specific application to apply the broader and more general teachings of the prior art to reduce H₂O contamination in all oxides to just one specific oxide cannot by itself be the sole basis for patentability. In

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conclusion, the broader problem with the broader solution as taught to apply to all oxides, would also solve applicant's narrower problem, regardless of whether or not the skilled artisan was ever even aware of applicant's discovered narrower problem.


CONCLUSION

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on Monday to Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached at (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


George Fourson
Primary Examiner
2823


7-1-02

Neal Berezny

Patent Examiner

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